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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/814,738

Applicant(s)

CHINCHURE ET AL.

Examiner

Tony Chuo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-3 and 5-30 are currently pending. The objections to the specification are withdrawn. The objection to claims 3, 10-11, 14, 19, and 26 is withdrawn. Claim 4 has been cancelled. The amended claims 1, 3, 5-6, 10-11, 14, 18-19, and 26 do not overcome the previously stated 102 and 103 rejections. Therefore, claims 1-3 and 5-30 stand rejected under the following 102 and 103 rejections.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-8, 10, 12, 17-22, 24, and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Katz et al (US 4983472). Regarding claims 1-2, 5-6, 18, 20, and 30, the Katz reference discloses fuel cell stack comprising a plurality of fuel cells, each fuel cell "10" comprising: an anode layer "14", a cathode layer "20", and an electrolyte "18" interposed in between; a plurality of separator plates "12" & "25" wherein each separator plate forms an anode interconnect to support the anode layer and a cathode interconnect to support the cathode layer wherein the anode interconnect and cathode interconnect are hollow manifolds comprising a top wall, a first side wall, and a second side wall defining a chamber therein with the top wall comprising an

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opening extending therethrough in flow communication with chamber; and a conducting layer "22" in contact with the cathode layer "20" and the separator plate "25" wherein the conducting layer is disposed on the cathode layer to reduce the interface resistance between the cathode layer and cathode interconnect and is configured to facilitate transport of electrons from anode and cathode layers (See Figure 1).

Regarding claims 3 and 19, it also discloses conducting layer "22" that is substantially hollow (See Figure 1).

Regarding claims 7-8 and 21-22, it also discloses hollow manifolds that are configured to provide a flow path for the fuel and oxidant with a separator sheet to separate the flow path of the fuel and oxidant (See Figure 1).

Regarding claim 10, it also discloses a conductive layer that has a thickness of 250 microns (See column 3, lines 3-4).

Regarding claims 12 and 24, it also discloses a conducting layer that is chemically compatible with the anode and cathode layers such as nickel and stainless steel (See column 2, line 61 to column 3, line 4).

Regarding claims 17 and 29, it also discloses a fuel cell assembly having a planar structure (See Figure 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz et al (US 4983472) in view of Akikusa et al (JP 2002-237312). The Katz reference is applied to claims 1-3, 5-8, 10, 12, 17-22, 24, and 29-30 for reasons stated above.

However, Katz et al does not expressly teach a conducting layer that has a shape selected from the group consisting of a mesh, a woven wire, a woven fiber, a felt and combinations thereof. The Akikusa reference discloses a conducting layer "18" that has a mesh like metal body (See paragraph [0012]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Katz conducting layer to include a conducting layer that has a shape selected from the group consisting of a mesh, a woven wire, a woven fiber, a felt and combinations thereof in order to utilize a conducting layer that is easier to manufacture than the arch formed plate material taught by Katz et al.

6. Claims 11, 13-16, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz et al (US 4983472) in view of Mardilovich et al (US 2004/0081878). The Katz reference is applied to claims 1-3, 5-8, 10, 12, 17-22, 24, and 29-30 for reasons stated above. However, Katz et al does not expressly teach a conducting layer that has a thickness of 1 to 50 micron, a conducting layer comprising a material selected from the group consisting of noble metals, metallic alloys, cermets, and oxides, a conducting layer comprising a material selected from the group consisting of gold, silver, platinum, palladium, iridium, ruthenium, rhodium, indium-tin-oxide, ruthenium oxide, rhodium oxide, iridium oxide, and indium oxide, and a fuel cell selected

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from the group consisting of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells. The Mardilovich reference discloses current collectors that has a thickness of 1 to 10 microns, a current collector comprising conductive metals, conductive oxides, and conductive cermets and further comprising gold, silver, platinum, palladium, ruthenium, and ruthenium oxide, and a fuel cell that may be one of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells (See paragraphs [0036],[0037],[0042],[0053]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Katz fuel cell to include current collectors that has a thickness of 1 to 10 microns, a current collector comprising conductive metals, conductive oxides, and conductive cermets and further comprising gold, silver, platinum, palladium, ruthenium, and ruthenium oxide, and a fuel cell that may be one of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells in order to utilize a type of fuel cell that is useful in portable applications, to utilize current collector materials that are compatible with solid oxide fuel cells, and to minimize the thickness of the current collector to increase the conductivity of the material.

7. Claims 13-16 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz et al (US 4983472) in view of Hoshino et al (JP 2002-216807). The Katz reference is applied to claims 1-3, 5-8, 10, 12, 17-22, 24, and 29-30 for reasons stated above. However, the Katz et al does not expressly teach a conducting layer comprising a material selected from the group consisting of noble metals, metallic alloys, cermets, and oxides, a conducting layer comprising a material selected from the

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group consisting of gold, silver, platinum, palladium, iridium, ruthenium, rhodium, indium-tin-oxide, ruthenium oxide, rhodium oxide, iridium oxide, and indium oxide, and a fuel cell selected from the group consisting of solid oxide fuel cells, direct methanol fuel cells, and protonic ceramic fuel cells. The Hoshino reference discloses a current collector comprising noble metals, metallic alloys, and oxides and further comprising gold, silver, platinum, palladium, iridium, and rhodium, and a fuel cell comprising a solid oxide fuel cells (See paragraphs [0007],[0013]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Katz fuel cell to include current collectors comprising noble metals, metallic alloys, and oxides and further comprising gold, silver, platinum, palladium, iridium, and rhodium, and a fuel cell comprising a solid oxide fuel cell in order to utilize a type of fuel cell that has higher energy density and to utilize materials compatible with solid oxide fuel cells..

Response to Arguments

8. Applicant's arguments filed on 9/14/06 have been fully considered but they are not persuasive. The applicant argues that Katz neither discloses nor suggests using a conducting layer between an anode and/or cathode and an interconnect. The current collector "22" taught by Katz et al is construed as a conducting layer because it functions to facilitate the transport of electrons. The separator plate "25" taught by Katz et al is construed as an interconnect because according to the applicant's specification the interconnect acts as a bipolar element which is a separator in a fuel cell. As shown in Figure 8 of Katz et al, the anode collector plate "90" and the cathode collector plate

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"22" are located adjacent to both the cathode and the anode. Therefore, the collector plates are disposed on both the cathode layer and anode layer to reduce interface resistance between the anode layer and the anode interconnect and between the cathode layer and the cathode interconnect wherein the separator plate "25" forms the anode interconnect and the cathode interconnect.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC



SUSYTSANG-FOSTER
PRIMARY EXAMINER